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(54) 【発明の名称】 新聞用紙用表面サイズ剤および新聞用紙の製造方法

(57) 【要約】

【構成】 置換コハク酸無水物を有効成分としてなる表面サイズ剤および紙表面加工剤を含有してなる塗工液を、ゲートロールコーターにより新聞原紙に塗工して新聞用紙を製造する。

【効果】 高濃度、高速塗工が可能なゲートロールコーターを用いて新聞用紙を製造することが可能になり、操業性を低下させず、また新聞用紙の品質を悪化させることなく新聞用紙に所望のサイズ性を付与することができる。

【特許請求の範囲】

【請求項1】 置換コハク酸無水物を有効成分としてなる新聞用紙用表面サイズ剤。

【請求項2】 紙表面加工剤および請求項1記載の表面サイズ剤を含有してなる塗工液を、ゲートロールコーターにより新聞原紙に塗工することを特徴とする新聞用紙の製造方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は新聞用紙用表面サイズ剤 10 および新聞用紙の製造方法に関する。

【0002】

【従来の技術】近年、新聞印刷方式のオフセット印刷への移行により、湿し水に対する耐水性が新聞用紙にとって重要な要求品質となっている。しかし、従来より紙に耐水性（サイズ性）を付与する方法として知られている方法、たとえば、抄紙時に内添サイズ剤を原料パルプスラリーに添加する方法や、抄紙後の紙に表面サイズ剤を塗工する方法は新聞用紙の製造に適用すると種々の問題がある。

【0003】すなわち、一般に新聞用紙が抄造される酸性抄紙で汎用されている内添サイズ剤であるロジンエマルジョンサイズ剤は、本来水溶性のないマレイン化またはフマル化ロジンを界面活性剤により水に分散させているため、本質的に泡立ちやすく、新聞抄紙機のような高速抄紙機では白水系で泡立ちによるトラブルを引き起こしやすいといった問題がある。また、新聞用紙はサイズ効果の発現にくいグランドパルプを原料として多用しているため、内添サイズ剤とともに歩留向上剤が併用される場合には抄紙系内のピッチ等も紙中に取り込み、新聞用紙の白色度を低下させ品質悪化の原因になるといった不利もある。

【0004】また、新聞抄紙機は高速抄紙機であり、オンマシンの表面加工剤の塗工は、サイズプレスのような低濃度塗工液を塗工する塗工機では紙切れを起こすため、塗工液濃度が高く、高速塗工が可能な被膜形成転写方式によるゲートロールコーターが一般的である。しかし、表面サイズ剤として知られているスチレン/マレイン酸共重合体、スチレン/アクリル共重合体、オレフィン/マレイン酸共重合体等のポリマーサイズ剤は、サイズ 40 プレスのように低濃度の塗工液で塗工され、紙に浸透した後に乾燥によりパルプ繊維と結合してサイズ効果を発現するように設計されているため、ゲートロールコーターに適用しても塗工液の紙層への浸透が少なく、ポリマーサイズ剤とパルプ繊維の結合が不十分であり、サイズ効果が全く発現しないか、または発現してもその効果が弱い。

【0005】このように、公知の表面サイズ剤を新聞用紙の製造に適用しても十分なサイズ効果が得られないため、操業性の低下、品質の悪化にもかかわらず内添サイ 50

ズ剤が使用されているが現状である。

【0006】

【発明が解決しようとする課題】本発明は、ゲートロールコーターを用いた新聞用紙の製造に適用でき、新聞用紙に所望のサイズ性を付与しうる新聞用紙用表面サイズ剤、および該表面サイズ剤を用いて新聞用紙を製造する方法を提供することを目的とする。

【0007】

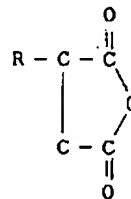
【課題を解決するための手段】本発明者は、前記従来技術の課題を解決すべく、鋭意研究を重ねた結果、表面サイズ剤として置換コハク酸無水物を用い、該置換コハク酸無水物と澱粉等の紙表面加工剤を併用して新聞用紙の製造に適用することにより、前記目的が達成されることを見出した。本発明はかかる新たな知見に基づき完成されたものである。

【0008】すなわち、本発明は、置換コハク酸無水物を有効成分とする新聞用紙用表面サイズ剤、ならびに紙表面加工剤および前記表面サイズ剤を含有してなる塗工液を、新聞原紙に塗工することを特徴とする新聞用紙の製造方法に関する。

【0009】本発明では、新聞用紙の表面サイズ剤として、置換コハク酸無水物を用いる。置換コハク酸無水物としては、一般式(1)：

【0010】

【化1】



【0011】(式中Rは、直鎖もしくは分岐鎖の炭素数6以上、好ましくは12~36のアルキル基、アルケニル基、アラルキル基またはアラルケニル基を表す。)で表される化合物があげられる。前記置換コハク酸無水物の炭素数が6未満の場合には疎水性が弱くサイズ剤として使用しても良好なサイズ効果は得られない。また、炭素数が36を超える場合には融点が高くなりすぎ塗工後の乾燥工程で溶融しないためパルプ繊維との反応が起こりにくくサイズ効果を発現しなくなる傾向がある。また、置換コハク酸無水物の無水環が開環して金属塩等になっている場合は、パルプ繊維との反応性が悪く十分なサイズ効果を発現しないため、置換コハク酸は無水物であることが必須とされる。

【0012】かかる置換コハク酸無水物としては、 α -オレフィン、内部オレフィンまたはプロピレンやブテン等のオリゴマーと無水マレイン酸との付加反応によって得られるアルケニルコハク酸無水物、該アルケニルコハク酸無水物を水素化して得られるアルキルコハク酸無水物、芳香環を有するオレフィン化合物から誘導されるア

ラルキルコハク酸無水物またはアラルケニルコハク酸無水物等があげられる。具体的にはオクテニルコハク酸無水物、ノネニルコハク酸無水物、ドデシルコハク酸無水物、ドデセニルコハク酸無水物、ペンタデセニルコハク酸無水物、ペンタデシルコハク酸無水物、ヘキサデセニルコハク酸無水物、オクタデセニルコハク酸無水物、(1-オクチル-2-デセニル)-コハク酸無水物、(1-ヘキシル-2-オクテニル)-コハク酸無水物、ブテンオリゴマーと無水マレイン酸との付加反応物、プロピレンオリゴマーと無水マレイン酸との付加反応物、ブタジエンオリゴマーまたはその部分水素化物と無水マレイン酸との付加反応物等があげられる。これらの置換コハク酸無水物は1種を単独でまたは2種以上を組み合わせ使用することができる。

【0013】また、前記置換コハク酸無水物は親水性が無い場合、使用に際し機械的に乳化するか、または適当な乳化剤を用いて乳化してから、紙表面加工剤とともに新聞用紙の製造に供することができる。

【0014】該置換コハク酸無水物を乳化させる場合には界面活性剤を使用する他に、ポリビニルアルコール、カチオン化澱粉等を保護コロイドとして用いることができる。界面活性剤としてはアニオン性、カチオン性、両性またはノニオン性の安定なエマルジョンを形成しうる各種公知のものを使用できる。アニオン性界面活性剤としては、例えばアルキル硫酸ソーダ、アルキルベンゼンスルホン酸ソーダ、ポリオキシエチレンアルキルエーテル硫酸ソーダ、ポリオキシエチレンアルキルフェニルエーテル硫酸ソーダ、アルキルスルホン酸ソーダ、ポリオキシエチレンアルキルエーテルスルホコハク酸ソーダ、ポリオキシエチレンアルキルエーテルリン酸エステル等があげられる。カチオン性界面活性剤としては、例えばラウリルトリメチルアンモニウムクロライド、ジヒドロキシエチルステアリンアミン等があげられる。両性界面活性剤としては、例えばラウリルアミノプロピオン酸ソーダ、ステアリルジメチルベタイン、ラウリルジヒドロキシエチルベタイン等があげられる。またノニオン性界面活性剤としては、例えばポリエチレングリコール、ポリオキシエチレンアルキルエーテル、ポリオキシエチレンアルキルフェニルエーテル等、およびこれらの末端水酸基のアセチル化物等があげられる。これら界面活性剤はいずれも1種を単独でまたは2種以上を組み合わせ使用することができる。界面活性剤の使用量は、乳化時の置換コハク酸無水物の無水環の安定性、得られるエマルジョンの水分散液の安定性、該水性分散液を用いて得られる新聞用紙のサイズ性などを考慮して適宜決定されるが、通常は置換コハク酸無水物に対して20重量%程度以下、好ましくは10重量%以下とされる。これら界面活性剤は、置換コハク酸無水物の乳化時に混合してもよく、置換コハク酸無水物の無水環を開環しない条件であれば乳化前に混合してもよい。

【0015】置換コハク酸無水物を乳化する方法は、置換コハク酸無水物が液状であり常温で十分な流動性をもつ場合は、該置換コハク酸無水物と水とを比例注入し反転乳化する方法、ホモジナイザー、ベンチュリー乳化機等の機械的な乳化による方法を採用できる。また、置換コハク酸無水物が液状でも高粘度であったり、固形の場合は、熱をかけ溶融状態にした後に前記と同じ操作によりエマルジョン化すればよい。また、乳化は置換コハク酸無水物の無水環が開環してしまわないように塗工直前に行うのがよい。

【0016】紙表面加工剤としては、通常の紙表面加工に使用されている各種公知のものがあげられる。たとえば、酸化澱粉、ジアルデヒド澱粉、りん酸澱粉、カチオン化澱粉などの澱粉類、完全ケン化ポリビニルアルコール、部分ケン化ポリビニルアルコール等のポリビニルアルコール類、カルボキシメチルセルロース類、アニオン性ポリアクリルアミド、カチオン性ポリアクリルアミド、両性ポリアクリルアミド等のポリアクリルアミド類等の各種の天然又は合成高分子物質があげられ、これら紙表面加工剤は1種を単独でまたは2種以上を組み合わせ使用できる。これらの紙表面加工剤は、表面強度の向上、紙粉防止、印刷適性の改善を目的として塗工されている。

【0017】前記表面サイズ剤と紙表面加工剤の使用量は、表面サイズ剤が紙表面加工剤に対して、固形分換算で、通常0.1~50重量%程度、好ましくは0.5~30重量%である。0.1重量%未満では十分なサイズ効果がなく、また50重量%を超えて使用した場合は塗工液中の表面加工剤の量が相対的に低下し、所望する紙表面の強度を得るには紙への塗工量を増加する必要があるが生じコストの上昇を招くため好ましくない。

【0018】紙表面加工剤と表面サイズ剤を、新聞原紙に塗布する方法は特に制限はされないが、通常は、紙表面加工剤の水溶液を紙表面に塗布する際に、該水溶液中に表面サイズ剤をエマルジョン化して混合添加し、該混合液を新聞原紙に塗布する方法を採用することができる。また、前記表面加工剤の水溶液を前記方法により新聞原紙に予め表面加工した後、改めて表面サイズ剤を塗布する方法等を採用してもよい。

【0019】また、紙表面加工剤と前記表面サイズ剤を含有してなる塗工液、または紙表面加工剤もしくは前記表面サイズ剤を含有してなる塗工液の塗布はゲートロールコーターを用いる。ゲートロールコーターは、塗工液を高速、高濃度で塗工でき、紙層表面への歩留まりが高く、乾燥熱量が少なくすみ、異種類の表面加工剤を用いて両面同時塗工が可能で、平滑度、白色度、光沢、インキ受理性等の印刷適性の改善ができること、更には高濃度塗工が可能で紙層中への水分移動が少なく塗工中の紙切れ、シワの発生が少ないこと等の利点があり新聞用紙の製造に適する。

【0020】紙表面加工剤と前記表面サイズ剤を含有してなる塗工液、または紙表面加工剤もしくは前記表面サイズ剤を含有してなる塗工液を、新聞原紙表面に塗工する際の濃度および粘度は特に制限はされないが、いずれの塗工液も、通常はそれぞれ不揮発分0.5~20重量%程度、好ましくは1~15重量%、粘度1000cps程度(25℃)以下、好ましくは200cps(25℃)以下とされる。

【0021】また、塗工液の塗布量は、新聞原紙に塗布された紙表面加工剤と前記表面サイズ剤の固形分付着量の合計量が、通常0.005~5.0g/m²程度、好ましくは0.01~2.0g/m²の範囲となるよう調節するのがよい。

【0022】

【発明の効果】本発明の表面サイズ剤によれば、高濃度、高速塗工が可能なゲートロールコーターを用いて新聞用紙を製造することが可能になり、操業性を低下させず、また新聞用紙の品質を悪化させることなく新聞用紙に所望のサイズ性を付与することができる。

【0023】

【実施例】以下、実施例を挙げて本発明を更に具体的に説明するが、本発明はこれらの実施例に限定されるものではない。なお、各例中の%は重量%を表す。

【0024】実施例1

テトラデセニルコハク酸無水物90部にドデシルベンゼンスルホン酸ナトリウム10部を加え攪拌しながら水を添加して乳化を行い、濃度10%のエマルジョンを得た。次いで10%濃度の酸化澱粉(王子コーンスターチ(株)製、王子エースA)水溶液50部に、水49部と前記エマルジョン1部を混合し塗工液を調製した。該塗工液をゲートロールコーターにて新聞原紙に塗工し、回転ドライヤーを用いて100℃で1分間乾燥させて新聞用紙を得た。なお、塗工量は表1に示す。

【0025】実施例2

10%濃度の酸化澱粉水溶液50部、水49.9部およびヘキサデセニルコハク酸無水物0.1部を容器にとり、ホモジナイザーを用いて塗工液を調製した。また、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0026】実施例3

冷却管、攪拌器の付いたフラスコにトリアコンテニルコハク酸無水物90部およびドデシルベンゼンスルホン酸ナトリウム10部を仕込み、攪拌、加熱しトリアコンテニルコハク酸無水物を溶解し、さらに熱水を加えて反転乳化したのち、希釈、冷却して濃度10%のエマルジョンを得た。次いで該エマルジョンを用いて実施例1と同様に塗工液を調製した。また、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0027】実施例4

実施例1において、テトラデセニルコハク酸無水物をオ

クタデセニルコハク酸無水物に代え、10%濃度の酸化澱粉水溶液を10%濃度のポリビニルアルコール

((株)クラレ製、PVA117)水溶液に代えた他は、実施例1と同様の操作を行い塗工液を調製した。また、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0028】実施例5

実施例2において、10%濃度の酸化澱粉水溶液50部を20%濃度のアニオン性ポリアクリルアミド(荒川化学工業(株)製、ポリマセット305)25部に代え、水を74.9部に代えた他は、実施例2と同様の操作を行い塗工液を調製した。また、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0029】比較例1

5%濃度の酸化澱粉水溶液を塗工液として使用した他は、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0030】比較例2

5%濃度のポリビニルアルコール((株)クラレ製、PVA117)水溶液を塗工液として使用した他は、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0031】比較例3

5%濃度のアニオン性ポリアクリルアミド(荒川化学工業(株)製、ポリマセット305)水溶液を塗工液として使用した他は、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0032】比較例4

10%濃度の酸化澱粉水溶液50部、水49.5部および20%濃度のテトラデセニルコハク酸カリウム水溶液0.5部を混合して得られた塗工液を使用した他は、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0033】比較例5

実施例2において、ヘキサデセニルコハク酸無水物をヘキサデセニルコハク酸に代えた他は、実施例2と同様の操作を行い塗工液を調製した。また、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0034】比較例6

10%濃度の酸化澱粉水溶液50部、水49.6部および25%濃度のスチレン/マレイン酸共重合体アンモニウム塩(スチレン/マレイン酸=50/50(モル%)、粘度2500cps(25℃)、pH9.5)水溶液0.4部を混合して得られた塗工液を使用した他は、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0035】比較例7

10%濃度のポリビニルアルコール水溶液50部、水49.6部および25%濃度のスチレン/アクリル共重合体ソーダ塩(スチレン/メタクリル酸ブチル/メタクリ

ル酸=40/20/40(モル%), 粘度800cps (25℃), pH10.0)水溶液0.4部を混合して得られた塗工液を使用した他は、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0036】比較例8

20%濃度のアニオン性ポリアクリルアミド水溶液(荒川化学工業(株)製、ポリマセット305)25部、水74.6部および25%オレフィン/マレイン酸共重合体アンモニウム塩(1-オクテン/マレイン酸=50/50(モル%), 粘度1800cps(25℃), pH 10

9.2)水溶液0.4部を混合して得られた塗工液を使*

*用した他は、実施例1と同様にして新聞用紙を得た。なお、塗工量は表1に示す。

【0037】(評価方法)実施例および比較例で得られた新聞用紙を恒温恒湿(20℃、65%R. H.)の環境下で1日調湿した後に、J. Tappi No. 33(吸収性の紙の吸水速度試験)に準じ、1マイクロリットルの脱イオン水が吸収されるまでの時間を測定した。評価結果を表1に示す。

【0038】

【表1】

	塗工量 (g/m ²)		吸水時間 (秒)
	吸液量	固形分	
実施例1	7.5	0.38	53.2
実施例2	7.9	0.40	56.3
実施例3	7.7	0.39	49.5
実施例4	8.5	0.43	45.6
実施例5	8.6	0.44	51.6
比較例1	7.5	0.38	3.2
比較例2	8.6	0.43	2.7
比較例3	8.9	0.45	3.3
比較例4	7.2	0.37	3.4
比較例5	7.6	0.39	3.3
比較例6	7.5	0.38	6.7
比較例7	8.4	0.43	5.4
比較例8	8.7	0.44	6.4

【0039】いずれの実施例も比較例にくらべ良好なサ※ ※イズ効果を示すことがわかる。

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : ARAKAWA CHEM IND CO LTD

(22)Date of filing : 30.06.1993

(72)Inventor : TORIGOE NORIAKI

(54) SURFACE SIZING AGENT FOR NEWSPRINT PAPER AND PRODUCTION OF NEWSPRINT PAPER

(57)Abstract:

PURPOSE: To enable the desired surface sizing without deteriorating the operating efficiency by applying a sizing coating liquid containing a substituted succinic anhydride as an active component through a gate roll coater to base paper of newspapers.

CONSTITUTION: This surface sizing agent for newsprint paper is obtained by adding water to an anhydride of a substituted succinic acid such as tetradecenylsuccinic acid, hexadecenylsuccinic acid or triacontenylsuccinic acid while adding dodecylbenzenesulfonic acid thereto and stirring the resultant mixture and providing an emulsion. Furthermore, this method for producing surface-sized newsprint paper is to mix the resultant emulsion with an aqueous solution of oxidized starch, prepare a sizing coating liquid having a viscosity of 1000cP, preferably ≤ 200 cP (at 25°C), subsequently apply the prepared sizing coating liquid through a gate roll coater in an amount within the range of 0.005-5.0g/m², preferably 0.01-2.0g/m² expressed in terms of a solid add-on to base paper of newspapers and dry the coated base paper with a dryer.

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CLAIMS

[Claim(s)]

[Claim 1] The surface sizing compound for newsprints which becomes considering a permutation succinic-acid anhydride as an active principle.

[Claim 2] The manufacture approach of the newsprint characterized by carrying out coating of the coating liquid which comes to contain a paper surface treatment agent and a surface sizing compound according to claim 1 to newspaper stencil paper by the gate roll coater.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the manufacture approach of the surface sizing compound for newsprints, and a newsprint.

[0002]

[Description of the Prior Art] In recent years, the water resisting property to dampening water serves as demand quality important for a newsprint by the shift to offset printing of a newspaper printing method. However, when the approach learned as an approach of giving a water resisting property (size nature) conventionally to paper, for example, the approach of adding an internal sizing compound to a raw material pulp slurry at the time of paper making, and the approach of carrying out coating of the surface sizing compound to the paper after paper making are applied to manufacture of a newsprint, they have various problems.

[0003] That is, since the rosin emulsion sizing compound which is an internal sizing compound currently used widely by acid paper making by which a newsprint is generally milled is making water distribute with a surfactant mallein-izing or the fumaric-ized rosin which originally does not have water solubility, it essentially tends to foam and has the problem of being easy to cause the trouble by foaming by the Hakusui system, in a high-speed paper machine like a newspaper paper machine. Moreover, since the grand pulp which a size effect cannot discover easily is used abundantly as a raw material, when a yield improver is used together with an internal sizing compound, a newsprint is incorporated to Kaminaka, and the pitch in a paper-making system etc. reduces the whiteness degree of a newsprint, and it also has the disadvantage of becoming the cause of quality aggravation.

[0004] Moreover, a newspaper paper machine is a high-speed paper machine, in order that the coating of the surface treatment agent of an on-machine may raise a slip of paper in the coater which carries out coating of low concentration coating liquid like size press, its coating liquid concentration is high and the gate roll coater by the coat formation imprint method in which high-speed coating is possible is common [coating]. It is found as a surface sizing compound. However, polymer sizing compounds, such as ***** styrene / maleic-acid copolymer, styrene / acrylic copolymer, and an olefin / maleic-acid copolymer Since it is designed so that it may combine with pulp fiber by desiccation and a size effect may be discovered after carrying out coating with low-concentration coating liquid like size press and permeating paper, Even if it applies to a gate roll coater, there is little osmosis in the paper of coating liquid, association of a polymer sizing compound and pulp fiber is inadequate, and the effectiveness is weak, even if a size effect is not discovered at all or it is discovered.

[0005] Thus, since sufficient size effect is not acquired even if it applies a well-known surface sizing compound to manufacture of a newsprint, it is the present condition although the internal sizing compound is used in spite of an operable fall and aggravation of quality.

[0006]

[Problem(s) to be Solved by the Invention] This invention can be applied to manufacture of the newsprint which used the gate roll coater, and aims at offering the approach of manufacturing a newsprint using the surface sizing compound for newsprints which can give desired size nature to a newsprint, and this surface sizing compound.

[0007]

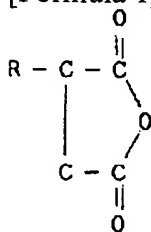
[Means for Solving the Problem] That the technical problem of said conventional technique should be solved, this invention person found out that said purpose was attained by using together paper surface treatment agents, such as this permutation succinic-acid anhydride and starch, and applying to manufacture of a newsprint, using a permutation succinic-acid anhydride as a surface sizing compound, as a result of repeating research wholeheartedly. This invention is completed based on the starting new knowledge.

[0008] That is, this invention relates to the manufacture approach of the newsprint characterized by carrying out coating of the coating liquid which comes to contain the surface sizing compound for newsprints which makes a permutation succinic-acid anhydride an active principle, a paper surface treatment agent, and said surface sizing compound to

newspaper stencil paper.

[0009] In this invention, a permutation succinic-acid anhydride is used as a surface sizing compound of a newsprint. As a permutation succinic-acid anhydride, it is general formula (1): [0010].

[Formula 1]



[0011] (-- the inside R of a formula expresses the alkyl group, the alkenyl radical, aralkyl radical, or ARARUKENIRU radical of 12-36 preferably six or more carbon numbers of a straight chain or branched chain.) -- the compound expressed is raised. When the carbon number of said permutation succinic-acid anhydride is less than six, even if hydrophobicity uses it as a sizing compound weakly, a good size effect is not acquired. Moreover, since the melting point becomes high too much and does not fuse at the desiccation process after coating when a carbon number exceeds 36, there is an inclination which stops discovering a size effect that a reaction with pulp fiber cannot occur easily. Moreover, when the anhydrous ring of a permutation succinic-acid anhydride carries out ring breakage and has become a metal salt etc., in order that reactivity with pulp fiber may not discover bad sufficient size effect, it is supposed that it is indispensable that it is an anhydride as for a permutation succinic acid.

[0012] As this permutation succinic-acid anhydride, the alkyl succinic-acid anhydride which hydrogenates the alkenyl succinic-acid anhydride and this alkenyl succinic-acid anhydride which are obtained by the addition reaction of oligomer, such as an alpha olefin, an internal olefin or a propylene, and a butene, and a maleic anhydride, and is obtained, the aralkyl succinic-acid anhydride guided from the olefin compound which has a ring, or an ARARUKE nil succinic-acid anhydride is raised. Specifically An OKUTE nil succinic-acid anhydride, a NONENIRU succinic-acid anhydride, a dodecyl succinic-acid anhydride, A dodecenyl succinic-acid anhydride, a PENTA decenyl succinic-acid anhydride, a pentadecyl succinic-acid anhydride, A hexa decenyl succinic-acid anhydride, an octadecenyl succinic-acid anhydride, a (1-octyl-2-decenyl)-succinic-acid anhydride, The addition reaction object of a (1-hexyl-2-OKUTENIRU)-succinic-acid anhydride, the addition reaction object of butene oligomer and a maleic anhydride, the addition reaction object of a propylene oligomer and a maleic anhydride, butadiene oligomer, or its partial hydride and maleic anhydride etc. is raised. These permutation succinic-acid anhydrides are independent, or can use one sort combining two or more sorts.

[0013] Moreover, in order that said permutation succinic-acid anhydride may not have a hydrophilic property, after emulsifying it mechanically on the occasion of use or emulsifying it using a suitable emulsifier, manufacture of a newsprint can be presented with it with a paper surface treatment agent.

[0014] In making this permutation succinic-acid anhydride emulsify, it uses a surface active agent, and also polyvinyl alcohol, cation-ized starch, etc. can be used as protective colloid. the various kinds which can form the stable emulsion of anionic, cationicity, both sexes, or nonionicity as a surface active agent -- a well-known thing can be used. As an anionic surface active agent, alkyl-sulfuric-acid soda, alkylbenzene-sulfonic-acid soda, polyoxyethylene-alkyl-ether sodium sulfate, polyoxyethylene-alkyl-phenyl-ether sodium sulfate, alkyl sulfonic-acid soda, polyoxyethylene-alkyl-ether sulfo succinic-acid soda, polyoxyethylene-alkyl-ether phosphoric ester, etc. are raised, for example. As a cationic surface active agent, lauryl trimethylammonium chloride, a dihydroxyethyl stearin amine, etc. are raised, for example. As an amphoteric surface active agent, lauryl aminopropionic acid soda, a stearyl dimethyl betaine, a lauryl dihydroxyethyl betaine, etc. are raised, for example. Moreover, as a nonionic surface active agent, the acetylation object of these end hydroxyl groups, such as a polyethylene glycol, polyoxyethylene alkyl ether, and polyoxyethylene alkyl phenyl ether, etc. is raised, for example. Each of these surfactants is independent, or can use one sort combining two or more sorts. Although the amount of the surfactant used is suitably determined in consideration of the stability of the anhydrous ring of the permutation succinic-acid anhydride at the time of emulsification, the stability of the water dispersion of the emulsion obtained, the size nature of the newsprint obtained using these aquosity dispersion liquid, etc., it is usually preferably made into 10 or less % of the weight about 20 or less % of the weight to a permutation succinic-acid anhydride. You may mix at the time of emulsification of a permutation succinic-acid anhydride, and as long as these surfactants are conditions which do not carry out ring breakage of the anhydrous ring of a permutation succinic-acid anhydride, they may be mixed before emulsification.

[0015] The approach of emulsifying a permutation succinic-acid anhydride has a liquefied permutation succinic-acid anhydride, when it has sufficient fluidity in ordinary temperature, it carries out proportionality impregnation of this permutation succinic-acid anhydride and the water, and the approach by mechanical emulsification of the approach of carrying out reversal emulsification, a homogenizer, a venturi tube emulsifier, etc. can be used for it. Moreover, what is necessary is just to emulsion-ize by the same actuation as the above, after being hyperviscosity even when a permutation

succinic-acid anhydride is liquefied, or applying heat in a solid case and changing into a melting condition. Moreover, emulsification is good to carry out just before coating so that the anhydrous ring of a permutation succinic-acid anhydride may not carry out ring breakage.

[0016] the various kinds currently used for the usual paper surface treatment as a paper surface treatment agent -- a well-known thing is raised. For example, various kinds of nature, such as polyacrylamides, such as polyvinyl alcohol, such as starch, such as oxidization starch, dialdehyde starch, phosphoric acid starch, and cation-ized starch, full saponification polyvinyl alcohol, and partial saponification polyvinyl alcohol, carboxymethyl celluloses, anionic polyacrylamide, cationic polyacrylamide, and both-sexes polyacrylamide, or the synthetic macromolecule matter is raised, and these papers surface treatment agent is independent, or can use one sort combining two or more sorts. Coating of these paper surface treatment agents is carried out for the purpose of improvement in surface reinforcement, paper powder prevention, and an improvement of a printability.

[0017] Surface sizing compounds are solid content conversion to a paper surface treatment agent, and the amount of said surface sizing compound and the paper surface treatment agent used is usually 0.5 - 30 % of the weight preferably about 0.1 to 50% of the weight. It is not desirable in order for the amount of the surface treatment agent in coating liquid to increase the amount of coating to paper to falling relatively and obtaining the reinforcement on the front face of paper for which it asks and to cause the rise of cost, when there is not Sais effectiveness sufficient at less than 0.1 % of the weight and it is used exceeding 50 % of the weight.

[0018] Although especially a limit is not carried out, in case the approach of applying a paper surface treatment agent and a surface sizing compound to newspaper stencil paper applies the water solution of a paper surface treatment agent to a paper front face, into this water solution, it can emulsion-ize a surface sizing compound, and mixed addition can be carried out, and it can usually adopt the approach of applying this mixed liquor to newspaper stencil paper. Moreover, after carrying out surface treatment of the water solution of said surface treatment agent to newspaper stencil paper beforehand by said approach, the approach of applying a surface sizing compound anew etc. may be adopted.

[0019] Moreover, spreading of the coating liquid which comes to contain the coating liquid which comes to contain a paper surface treatment agent and said surface sizing compound, a paper surface treatment agent, or said surface sizing compound uses a gate roll coater. A gate roll coater can carry out coating of the coating liquid in a high speed and high concentration, and the yield on the front face of paper is high, there are few desiccation heating values, it ends, and double-sided coincidence coating is possible using the surface treatment agent of different species, There are advantages, like that an improvement of printabilities, such as smoothness, a whiteness degree, gloss, and ink acceptance nature, can be performed and since high concentration coating is still more possible, there is little moisture transfer to the inside of paper, and there are little the slip of paper in coating and generating of Siwa, and it is suitable for manufacture of a newsprint.

[0020] The coating liquid which comes to contain the coating liquid which comes to contain a paper surface treatment agent and said surface sizing compound, a paper surface treatment agent, or said surface sizing compound although especially a limit is not carried out for the concentration and viscosity at the time of carrying out coating to a newspaper stencil paper front face -- any coating liquid -- usually -- respectively -- about 0.5 - 20 % of the weight of nonvolatile matters -- being preferably taken below for 200cps (25 degrees C) hereafter the viscosity of about (25 degrees C) 1000cps one to 15% of the weight.

[0021] moreover, the total quantity of the solid content coating weight of the paper surface treatment agent by which the coverage of coating liquid was applied to newspaper stencil paper, and said surface sizing compound -- usually -- 0.005 - 5.0 g/m² extent -- desirable -- 0.01 - 2.0 g/m² It is good to adjust so that it may become the range.

[0022]

[Effect of the Invention] According to the surface sizing compound of this invention, desired size nature can be given to a newsprint, without becoming possible to manufacture a newsprint using the gate roll coater in which high concentration and high-speed coating are possible, and not reducing operability, and worsening the quality of a newsprint.

[0023]

[Example] Although an example is given and this invention is explained still more concretely hereafter, this invention is not limited to these examples. In addition, % in each example expresses weight %.

[0024] It emulsified by having added water, adding and agitating the sodium dodecylbenzenesulfonate 10 section in the example 1 tetra-decenyl succinic-acid anhydride 90 section, and the emulsion of 10% of concentration was obtained. Subsequently, in the oxidization starch (product [made from Oji Corn starch], the Oji ace A) water-solution 50 section of concentration, the water 49 section and said emulsion 1 section were mixed 10%, and coating liquid was prepared. Carried out coating of this coating liquid to newspaper stencil paper in the gate roll coater, it was made to dry for 1 minute at 100 degrees C using a rotation dryer, and the newsprint was obtained. In addition, the amount of coating is shown in Table 1.

[0025] Coating liquid was prepared for the oxidization starch water-solution 50 section of 210% concentration of examples, the water 49.9 section, and the hexa decenyl succinic-acid anhydride 0.1 section for the container using the

homogenizer. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0026] The thoria conte nil succinic-acid anhydride 90 section and the sodium dodecylbenzenesulfonate 10 section were taught and heated [agitated and] in the flask to which example 3 cooling pipe and the stirrer were attached, the thoria conte nil succinic-acid anhydride was fused, after adding hot water further and carrying out reversal emulsification, it diluted and cooled and the emulsion of 10% of concentration was obtained. Subsequently, coating liquid was prepared like the example 1 using this emulsion. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0027] In example 4 example 1, replaced the tetra-decenyl succinic-acid anhydride with the octadecenyl succinic-acid anhydride, and the oxidization starch water solution of concentration was replaced with the polyvinyl alcohol (Kuraray Make, PVA117) water solution of concentration 10% 10%, and also the same actuation as an example 1 was performed, and coating liquid was prepared. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0028] In example 5 example 2, replaced the oxidized starch water-solution 50 section of concentration with the anionic polyacrylamide (product [made from Arakawa Chemical industry], polymer set 305) 25 section of concentration 20% 10%, and water was replaced with the 74.9 sections, and also the same actuation as an example 2 was performed, and coating liquid was prepared. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0029] The oxidized starch water solution of 15% concentration of examples of a comparison was used as coating liquid, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0030] The polyvinyl alcohol (Kuraray Make, PVA117) water solution of 25% concentration of examples of a comparison was used as coating liquid, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0031] The anionic polyacrylamide (product [made from Arakawa Chemical industry], polymer set 305) water solution of 35% concentration of examples of a comparison was used as coating liquid, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0032] The coating liquid which mixed the oxidization starch water-solution 50 section of 410% concentration of examples of a comparison, the water 49.5 section, and tetra-decenyl pottassium-succinate water-solution of 20% concentration 0.5 section, and was obtained was used, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0033] In example of comparison 5 example 2, the hexa decenyl succinic-acid anhydride was replaced with the hexa decenyl succinic acid, and also the same actuation as an example 2 was performed, and coating liquid was prepared. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0034] The coating liquid which mixed the oxidization starch water-solution 50 section of 610% concentration of examples of a comparison, the water 49.6 section, and the styrene / maleic-acid copolymer ammonium salt (styrene/maleic acid = 50/50 (mol %), viscosity [of 2500cps (25 degrees C)], pH9.5) water-solution 0.4 section of 25% concentration, and was obtained was used, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0035] The coating liquid which mixed the polyvinyl alcohol water-solution 50 section of 710% concentration of examples of a comparison, the water 49.6 section, and the styrene / acrylic copolymer specific salt (styrene / methacrylic-acid butyl / methacrylic-acid =40/20/40 (mol %), viscosity [of 800cps (25 degrees C)], pH10.0) water-solution 0.4 section of 25% concentration, and was obtained was used, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0036] The coating liquid which mixed the anionic polyacrylamide water-solution (product [made from Arakawa Chemical industry], polymer set 305) 25 section of 820% concentration of examples of a comparison, the water 74.6 section, and the 25% olefin / maleic-acid copolymer ammonium salt (1-octene / maleic acid = 50/50 (mol %), viscosity [of 1800cps (25 degrees C)], pH9.2) water-solution 0.4 section, and was obtained was used, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0037] (The evaluation approach) it obtains in an example and the example of a comparison -- having -- hanging down -- a newsprint -- constant temperature -- after carrying out gas conditioning under the environment of constant humidity (20 degrees C, 65%R.H.) for one day -- J.Tappi According to No.33 (water absorption speed test of the paper of absorptivity), time amount until the deionized water of one microliter is absorbed was measured. An evaluation result is shown in Table 1.

[0038]

[Table 1]

	塗工量 (g/m ²)		吸水時間 (秒)
	吸液量	固形分	
実施例 1	7. 5	0. 3 8	5 3. 2
実施例 2	7. 9	0. 4 0	5 6. 3
実施例 3	7. 7	0. 3 9	4 9. 5
実施例 4	8. 5	0. 4 3	4 5. 6
実施例 5	8. 6	0. 4 4	5 1. 6
比較例 1	7. 5	0. 3 8	3. 2
比較例 2	8. 6	0. 4 3	2. 7
比較例 3	8. 9	0. 4 5	3. 3
比較例 4	7. 2	0. 3 7	3. 4
比較例 5	7. 6	0. 3 9	3. 3
比較例 6	7. 5	0. 3 8	6. 7
比較例 7	8. 4	0. 4 3	5. 4
比較例 8	8. 7	0. 4 4	6. 4

[0039] Any example is known by that a good size effect is shown compared with the example of a comparison.

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TECHNICAL FIELD

[Industrial Application] This invention relates to the manufacture approach of the surface sizing compound for newsprints, and a newsprint.

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PRIOR ART

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[0003] That is, since the rosin emulsion sizing compound which is an internal sizing compound currently used widely by acid paper making by which a newsprint is generally milled is making water distribute with a surfactant mallein-izing or the fumaric-ized rosin which originally does not have water solubility, it essentially tends to foam and has the problem of being easy to cause the trouble by foaming by the Hakusui system, in a high-speed paper machine like a newspaper paper machine. Moreover, since the grand pulp which a size effect cannot discover easily is used abundantly as a raw material, when a yield improver is used together with an internal sizing compound, a newsprint is incorporated to Kaminaka, and the pitch in a paper-making system etc. reduces the whiteness degree of a newsprint, and it also has the disadvantage of becoming the cause of quality aggravation.

[0004] Moreover, a newspaper paper machine is a high-speed paper machine, in order that the coating of the surface treatment agent of an on-machine may raise a slip of paper in the coater which carries out coating of low concentration coating liquid like size press, its coating liquid concentration is high and the gate roll coater by the coat formation imprint method in which high-speed coating is possible is common [coating]. It is found as a surface sizing compound.

However, polymer sizing compounds, such as ***** styrene / maleic-acid copolymer, styrene / acrylic copolymer, and an olefin / maleic-acid copolymer Since it is designed so that it may combine with pulp fiber by desiccation and a size effect may be discovered after carrying out coating with low-concentration coating liquid like size press and permeating paper, Even if it applies to a gate roll coater, there is little osmosis in the paper of coating liquid, association of a polymer sizing compound and pulp fiber is inadequate, and the effectiveness is weak, even if a size effect is not discovered at all or it is discovered.

[0005] Thus, since sufficient size effect is not acquired even if it applies a well-known surface sizing compound to manufacture of a newsprint, it is the present condition although the internal sizing compound is used in spite of an operable fall and aggravation of quality.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to the surface sizing compound of this invention, desired size nature can be given to a newsprint, without becoming possible to manufacture a newsprint using the gate roll coater in which high concentration and high-speed coating are possible, and not reducing operability, and worsening the quality of a newsprint.

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TECHNICAL PROBLEM

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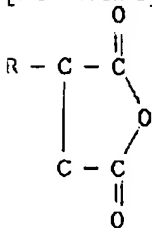
MEANS

[Means for Solving the Problem] That the technical problem of said conventional technique should be solved, this invention person found out that said purpose was attained by using together paper surface treatment agents, such as this permutation succinic-acid anhydride and starch, and applying to manufacture of a newsprint, using a permutation succinic-acid anhydride as a surface sizing compound, as a result of repeating research wholeheartedly. This invention is completed based on the starting new knowledge.

[0008] That is, this invention relates to the manufacture approach of the newsprint characterized by carrying out coating of the coating liquid which comes to contain the surface sizing compound for newsprints which makes a permutation succinic-acid anhydride an active principle, a paper surface treatment agent, and said surface sizing compound to newspaper stencil paper.

[0009] In this invention, a permutation succinic-acid anhydride is used as a surface sizing compound of a newsprint. As a permutation succinic-acid anhydride, it is general formula (1): [0010].

[Formula 1]



[0011] (-- the inside R of a formula expresses the alkyl group, the alkenyl radical, aralkyl radical, or ARARUKENIRU radical of 12-36 preferably six or more carbon numbers of a straight chain or branched chain.) -- the compound expressed is raised. When the carbon number of said permutation succinic-acid anhydride is less than six, even if hydrophobicity uses it as a sizing compound weakly, a good size effect is not acquired. Moreover, since the melting point becomes high too much and does not fuse at the desiccation process after coating when a carbon number exceeds 36, there is an inclination which stops discovering a size effect that a reaction with pulp fiber cannot occur easily. Moreover, when the anhydrous ring of a permutation succinic-acid anhydride carries out ring breakage and has become a metal salt etc., in order that reactivity with pulp fiber may not discover bad sufficient size effect, it is supposed that it is indispensable that it is an anhydride as for a permutation succinic acid.

[0012] As this permutation succinic-acid anhydride, the alkyl succinic-acid anhydride which hydrogenates the alkenyl succinic-acid anhydride and this alkenyl succinic-acid anhydride which are obtained by the addition reaction of oligomer, such as an alpha olefin, an internal olefin or a propylene, and a butene, and a maleic anhydride, and is obtained, the aralkyl succinic-acid anhydride guided from the olefin compound which has a ring, or an ARARUKE nil succinic-acid anhydride is raised. Specifically An OKUTE nil succinic-acid anhydride, a NONENIRU succinic-acid anhydride, a dodecyl succinic-acid anhydride, A dodecenyl succinic-acid anhydride, a PENTA decenyl succinic-acid anhydride, a pentadecyl succinic-acid anhydride, A hexa decenyl succinic-acid anhydride, an octadecenyl succinic-acid anhydride, a (1-octyl-2-decenyl)-succinic-acid anhydride, The addition reaction object of a (1-hexyl-2-OKUTENIRU)-succinic-acid anhydride, the addition reaction object of butene oligomer and a maleic anhydride, the addition reaction object of a propylene oligomer and a maleic anhydride, butadiene oligomer, or its partial hydride and maleic anhydride etc. is raised. These permutation succinic-acid anhydrides are independent, or can use one sort combining two or more sorts.

[0013] Moreover, in order that said permutation succinic-acid anhydride may not have a hydrophilic property, after emulsifying it mechanically on the occasion of use or emulsifying it using a suitable emulsifier, manufacture of a newsprint can be presented with it with a paper surface treatment agent.

[0014] In making this permutation succinic-acid anhydride emulsify, it uses a surface active agent, and also polyvinyl alcohol, cation-ized starch, etc. can be used as protective colloid. the various kinds which can form the stable emulsion of anionic, cationicity, both sexes, or nonionicity as a surface active agent -- a well-known thing can be used. As an anionic

surface active agent, alkyl-sulfuric-acid soda, alkylbenzene-sulfonic-acid soda, polyoxyethylene-alkyl-ether sodium sulfate, polyoxyethylene-alkyl-phenyl-ether sodium sulfate, alkyl sulfonic-acid soda, polyoxyethylene-alkyl-ether sulfo succinic-acid soda, polyoxyethylene-alkyl-ether phosphoric ester, etc. are raised, for example. As a cationic surface active agent, lauryl trimethylammonium chloride, a dihydroxyethyl stearin amine, etc. are raised, for example. As an amphoteric surface active agent, lauryl aminopropionic acid soda, a stearyl dimethyl betaine, a lauryl dihydroxyethyl betaine, etc. are raised, for example. Moreover, as a nonionic surface active agent, the acetylation object of these end hydroxyl groups, such as a polyethylene glycol, polyoxyethylene alkyl ether, and polyoxyethylene alkyl phenyl ether, etc. is raised, for example. Each of these surfactants is independent, or can use one sort combining two or more sorts. Although the amount of the surfactant used is suitably determined in consideration of the stability of the anhydrous ring of the permutation succinic-acid anhydride at the time of emulsification, the stability of the water dispersion of the emulsion obtained, the size nature of the newsprint obtained using these aqueous dispersion liquid, etc., it is usually preferably made into 10 or less % of the weight about 20 or less % of the weight to a permutation succinic-acid anhydride. You may mix at the time of emulsification of a permutation succinic-acid anhydride, and as long as these surfactants are conditions which do not carry out ring breakage of the anhydrous ring of a permutation succinic-acid anhydride, they may be mixed before emulsification.

[0015] The approach of emulsifying a permutation succinic-acid anhydride has a liquefied permutation succinic-acid anhydride, when it has sufficient fluidity in ordinary temperature, it carries out proportionality impregnation of this permutation succinic-acid anhydride and the water, and the approach by mechanical emulsification of the approach of carrying out reversal emulsification, a homogenizer, a venturi tube emulsifier, etc. can be used for it. Moreover, what is necessary is just to emulsion-ize by the same actuation as the above, after being hyperviscosity even when a permutation succinic-acid anhydride is liquefied, or applying heat in a solid case and changing into a melting condition. Moreover, emulsification is good to carry out just before coating so that the anhydrous ring of a permutation succinic-acid anhydride may not carry out ring breakage.

[0016] the various kinds currently used for the usual paper surface treatment as a paper surface treatment agent -- a well-known thing is raised. For example, various kinds of nature, such as polyacrylamides, such as polyvinyl alcohol, such as starch, such as oxidization starch, dialdehyde starch, phosphoric acid starch, and cation-ized starch, full saponification polyvinyl alcohol, and partial saponification polyvinyl alcohol, carboxymethyl celluloses, anionic polyacrylamide, cationic polyacrylamide, and both-sexes polyacrylamide, or the synthetic macromolecule matter is raised, and these papers surface treatment agent is independent, or can use one sort combining two or more sorts. Coating of these paper surface treatment agents is carried out for the purpose of improvement in surface reinforcement, paper powder prevention, and an improvement of a printability.

[0017] Surface sizing compounds are solid content conversion to a paper surface treatment agent, and the amount of said surface sizing compound and the paper surface treatment agent used is usually 0.5 - 30 % of the weight preferably about 0.1 to 50% of the weight. It is not desirable in order for the amount of the surface treatment agent in coating liquid to increase the amount of coating to paper to falling relatively and obtaining the reinforcement on the front face of paper for which it asks and to cause the rise of cost, when there is not Sais effectiveness sufficient at less than 0.1 % of the weight and it is used exceeding 50 % of the weight.

[0018] Although especially a limit is not carried out, in case the approach of applying a paper surface treatment agent and a surface sizing compound to newspaper stencil paper applies the water solution of a paper surface treatment agent to a paper front face, into this water solution, it can emulsion-ize a surface sizing compound, and mixed addition can be carried out, and it can usually adopt the approach of applying this mixed liquor to newspaper stencil paper. Moreover, after carrying out surface treatment of the water solution of said surface treatment agent to newspaper stencil paper beforehand by said approach, the approach of applying a surface sizing compound anew etc. may be adopted.

[0019] Moreover, spreading of the coating liquid which comes to contain the coating liquid which comes to contain a paper surface treatment agent and said surface sizing compound, a paper surface treatment agent, or said surface sizing compound uses a gate roll coater. A gate roll coater can carry out coating of the coating liquid in a high speed and high concentration, and the yield on the front face of paper is high, there are few desiccation heating values, it ends, and double-sided coincidence coating is possible using the surface treatment agent of different species, There are advantages, like that an improvement of printabilities, such as smoothness, a whiteness degree, gloss, and ink acceptance nature, can be performed and since high concentration coating is still more possible, there is little moisture transfer to the inside of paper, and there are little the slip of paper in coating and generating of Siwa, and it is suitable for manufacture of a newsprint.

[0020] The coating liquid which comes to contain the coating liquid which comes to contain a paper surface treatment agent and said surface sizing compound, a paper surface treatment agent, or said surface sizing compound although especially a limit is not carried out for the concentration and viscosity at the time of carrying out coating to a newspaper stencil paper front face -- any coating liquid -- usually -- respectively -- about 0.5 - 20 % of the weight of nonvolatile matters -- being preferably taken below for 200cps (25 degrees C) hereafter the viscosity of about (25 degrees C) 1000cps

one to 15% of the weight.

[0021] moreover, the total quantity of the solid content coating weight of the paper surface treatment agent by which the coverage of coating liquid was applied to newspaper stencil paper, and said surface sizing compound -- usually -- 0.005 - 5.0 g/m² extent -- desirable -- 0.01 - 2.0 g/m² It is good to adjust so that it may become the range.

[Translation done.]

*** NOTICES ***

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EXAMPLE

[Example] Although an example is given and this invention is explained still more concretely hereafter, this invention is not limited to these examples. In addition, % in each example expresses weight %.

[0024] It emulsified by having added water, adding and agitating the sodium dodecylbenzenesulfonate 10 section in the example 1 tetra-decenyl succinic-acid anhydride 90 section, and the emulsion of 10% of concentration was obtained. Subsequently, in the oxidization starch (product [made from Oji Corn starch], the Oji ace A) water-solution 50 section of concentration, the water 49 section and said emulsion 1 section were mixed 10%, and coating liquid was prepared. Carried out coating of this coating liquid to newspaper stencil paper in the gate roll coater, it was made to dry for 1 minute at 100 degrees C using a rotation dryer, and the newsprint was obtained. In addition, the amount of coating is shown in Table 1.

[0025] Coating liquid was prepared for the oxidization starch water-solution 50 section of 210% concentration of examples, the water 49.9 section, and the hexa decenyl succinic-acid anhydride 0.1 section for the container using the homogenizer. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0026] The thoria conte nil succinic-acid anhydride 90 section and the sodium dodecylbenzenesulfonate 10 section were taught and heated [agitated and] in the flask to which example 3 cooling pipe and the stirrer were attached, the thoria conte nil succinic-acid anhydride was fused, after adding hot water further and carrying out reversal emulsification, it diluted and cooled and the emulsion of 10% of concentration was obtained. Subsequently, coating liquid was prepared like the example 1 using this emulsion. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0027] In example 4 example 1, replaced the tetra-decenyl succinic-acid anhydride with the octadecenyl succinic-acid anhydride, and the oxidization starch water solution of concentration was replaced with the polyvinyl alcohol (Kuraray Make, PVA117) water solution of concentration 10% 10%, and also the same actuation as an example 1 was performed, and coating liquid was prepared. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0028] In example 5 example 2, replaced the oxidized starch water-solution 50 section of concentration with the anionic polyacrylamide (product [made from Arakawa Chemical industry], polymer set 305) 25 section of concentration 20% 10%, and water was replaced with the 74.9 sections, and also the same actuation as an example 2 was performed, and coating liquid was prepared. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0029] The oxidized starch water solution of 15% concentration of examples of a comparison was used as coating liquid, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0030] The polyvinyl alcohol (Kuraray Make, PVA117) water solution of 25% concentration of examples of a comparison was used as coating liquid, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0031] The anionic polyacrylamide (product [made from Arakawa Chemical industry], polymer set 305) water solution of 35% concentration of examples of a comparison was used as coating liquid, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0032] The coating liquid which mixed the oxidization starch water-solution 50 section of 410% concentration of examples of a comparison, the water 49.5 section, and tetra-decenyl pottassium-succinate water-solution of 20% concentration 0.5 section, and was obtained was used, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0033] In example of comparison 5 example 2, the hexa decenyl succinic-acid anhydride was replaced with the hexa decenyl succinic acid, and also the same actuation as an example 2 was performed, and coating liquid was prepared. Moreover, the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0034] The coating liquid which mixed the oxidization starch water-solution 50 section of 610% concentration of

examples of a comparison, the water 49.6 section, and the styrene / maleic-acid copolymer ammonium salt (styrene/maleic acid = 50/50 (mol %), viscosity [of 2500cps (25 degrees C)], pH9.5) water-solution 0.4 section of 25% concentration, and was obtained was used, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0035] The coating liquid which mixed the polyvinyl alcohol water-solution 50 section of 710% concentration of examples of a comparison, the water 49.6 section, and the styrene / acrylic copolymer specific salt (styrene / methacrylic-acid butyl / methacrylic-acid =40/20/40 (mol %), viscosity [of 800cps (25 degrees C)], pH10.0) water-solution 0.4 section of 25% concentration, and was obtained was used, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0036] The coating liquid which mixed the anionic polyacrylamide water-solution (product [made from Arakawa Chemical industry], polymer set 305) 25 section of 820% concentration of examples of a comparison, the water 74.6 section, and the 25% olefin / maleic-acid copolymer ammonium salt (1-octene / maleic acid = 50/50 (mol %), viscosity [of 1800cps (25 degrees C)], pH9.2) water-solution 0.4 section, and was obtained was used, and also the newsprint was obtained like the example 1. In addition, the amount of coating is shown in Table 1.

[0037] (The evaluation approach) it obtains in an example and the example of a comparison -- having -- hanging down -- a newsprint -- constant temperature -- after carrying out gas conditioning under the environment of constant humidity (20 degrees C, 65%R.H.) for one day -- J.Tappi According to No.33 (water absorption speed test of the paper of absorptivity), time amount until the deionized water of one microliter is absorbed was measured. An evaluation result is shown in Table 1.

[0038]

[Table 1]

	塗工量 (g/m ²)		吸水時間 (秒)
	吸液量	固形分	
実施例 1	7. 5	0. 3 8	5 3. 2
実施例 2	7. 9	0. 4 0	5 6. 3
実施例 3	7. 7	0. 3 9	4 9. 5
実施例 4	8. 5	0. 4 3	4 5. 6
実施例 5	8. 6	0. 4 4	5 1. 6
比較例 1	7. 5	0. 3 8	3. 2
比較例 2	8. 6	0. 4 3	2. 7
比較例 3	8. 9	0. 4 5	3. 3
比較例 4	7. 2	0. 3 7	3. 4
比較例 5	7. 6	0. 3 9	3. 3
比較例 6	7. 5	0. 3 8	6. 7
比較例 7	8. 4	0. 4 3	5. 4
比較例 8	8. 7	0. 4 4	6. 4

[0039] Any example is known by that a good size effect is shown compared with the example of a comparison.

[Translation done.]